DRILLED SHAFT CONSTRUCTION METHODS, EQUIPMENT, & MATERIALS

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WSDOT ONE-DAY DRILLED SHAFT DESIGN WORKSHOP

MARCH 26, 2004

CONSTRUCTION METHODS

DBM CM

General Drilled Shaft Construction Methods

1. *"Dry" Method*
2. *"Wet" Method*
3. *Casing Method*

Dry Method

- *Used when boreholes will stand open*
- *Visual inspection of borehole*
- *Faster and less expensive than other methods*

Wet Method

- *Used if caving or water-bearing soils are present near base elevation*
- *Direct, visual inspection not possible*
- *Contractor skill is essential*

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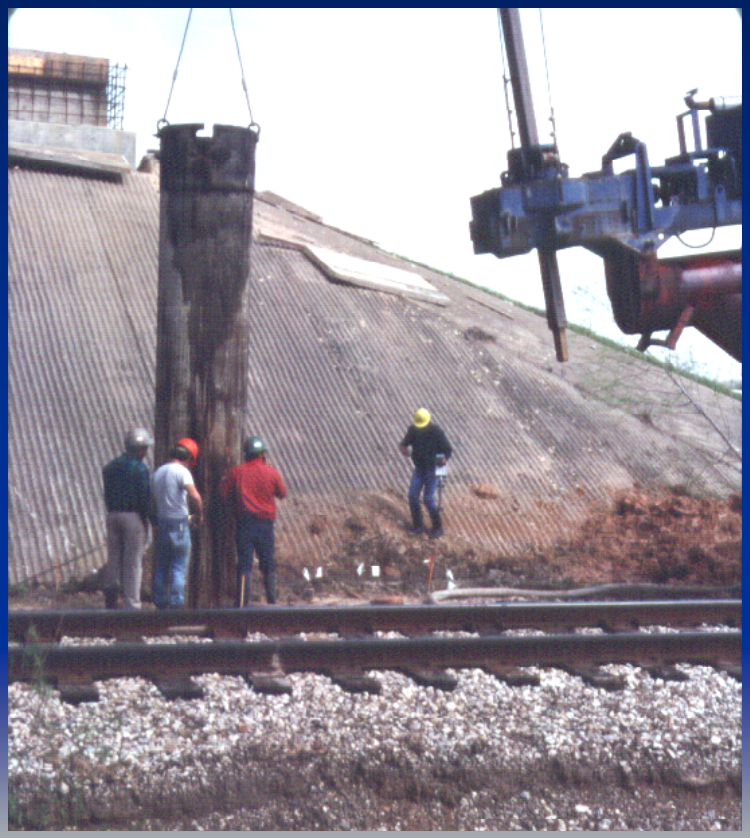
FUNCTIONS OF SLURRY

- Maintain stability of the excavation
- Prevent suspended particles from settling to the bottom
- Allow clean displacement by concrete
- Allow easy pumping

Casing Method



- *Near-surface soils may cave / deep soils or rock are stable and dry*
- *Otherwise, full-depth casing (or wet method) is considered*

Full-Depth Casing Alternates

- Duplex Drilling
- Casing Vibration
- Casing Telescoping
- Casing Oscillation
- Casing Rotation

DBM CM


MALCOLM
LIEBHERR
2 11 98


MALCOLM

CONSTRUCTION EQUIPMENT

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Basic elements of a drilled shaft rig

DBM
CM


ANDERSON


Shirley

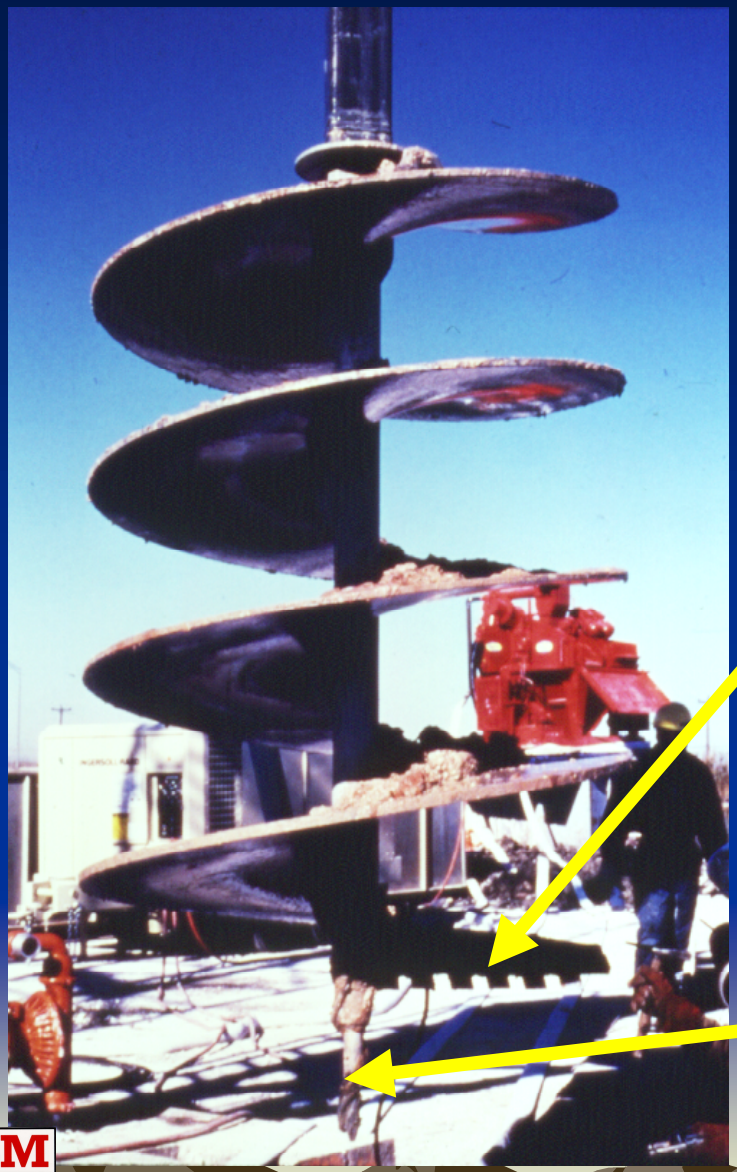

IMT


HITACHI
EX300

Drilling Tools

- Choice of tools may be more important than choice of rigs

Single-Helix Soil Auger



Soil Teeth (Blunt / Wide)

Guide Shaft (“Stinger”)

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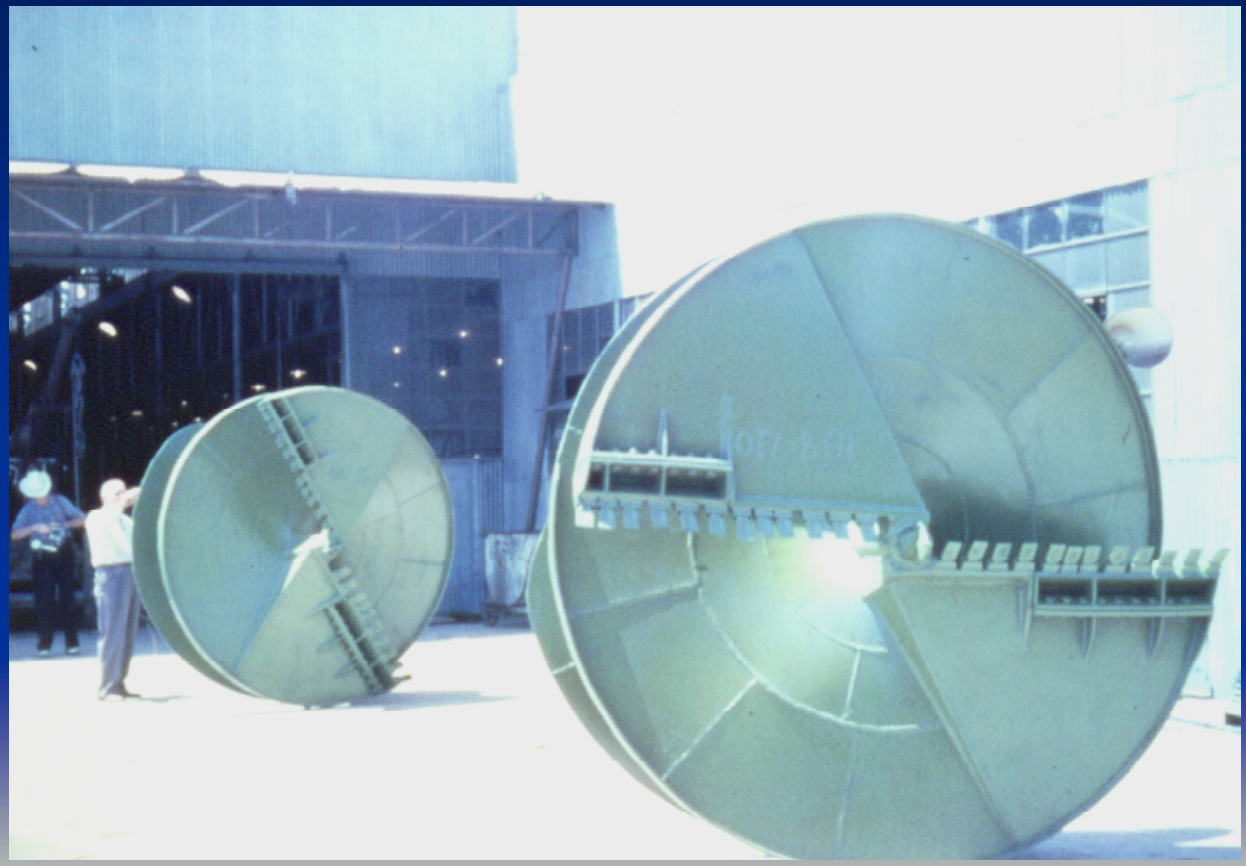
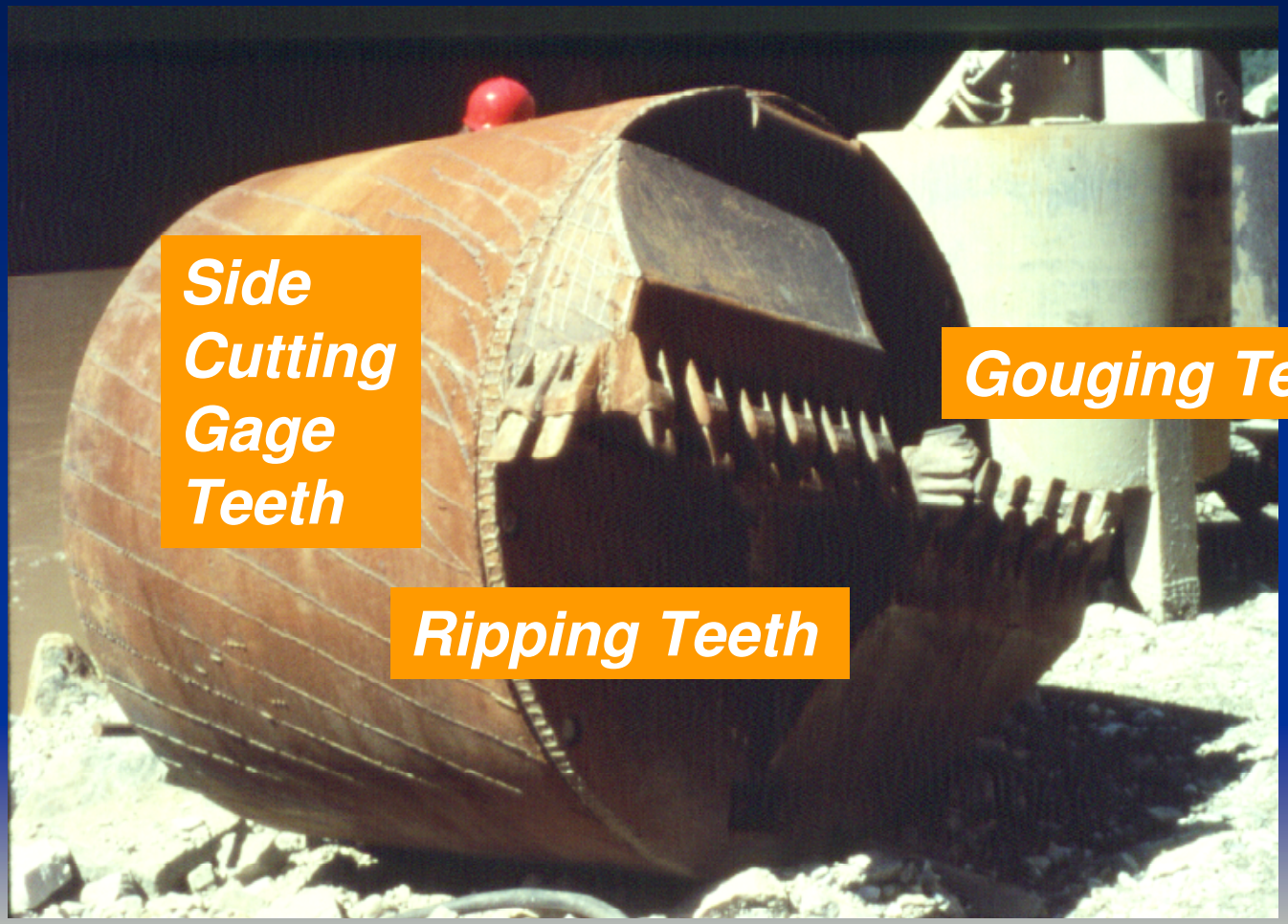
Double-Helix Soil Auger



Drilling Bucket



Rock Auger

Tapered Geometry

Conical Carbide Teeth

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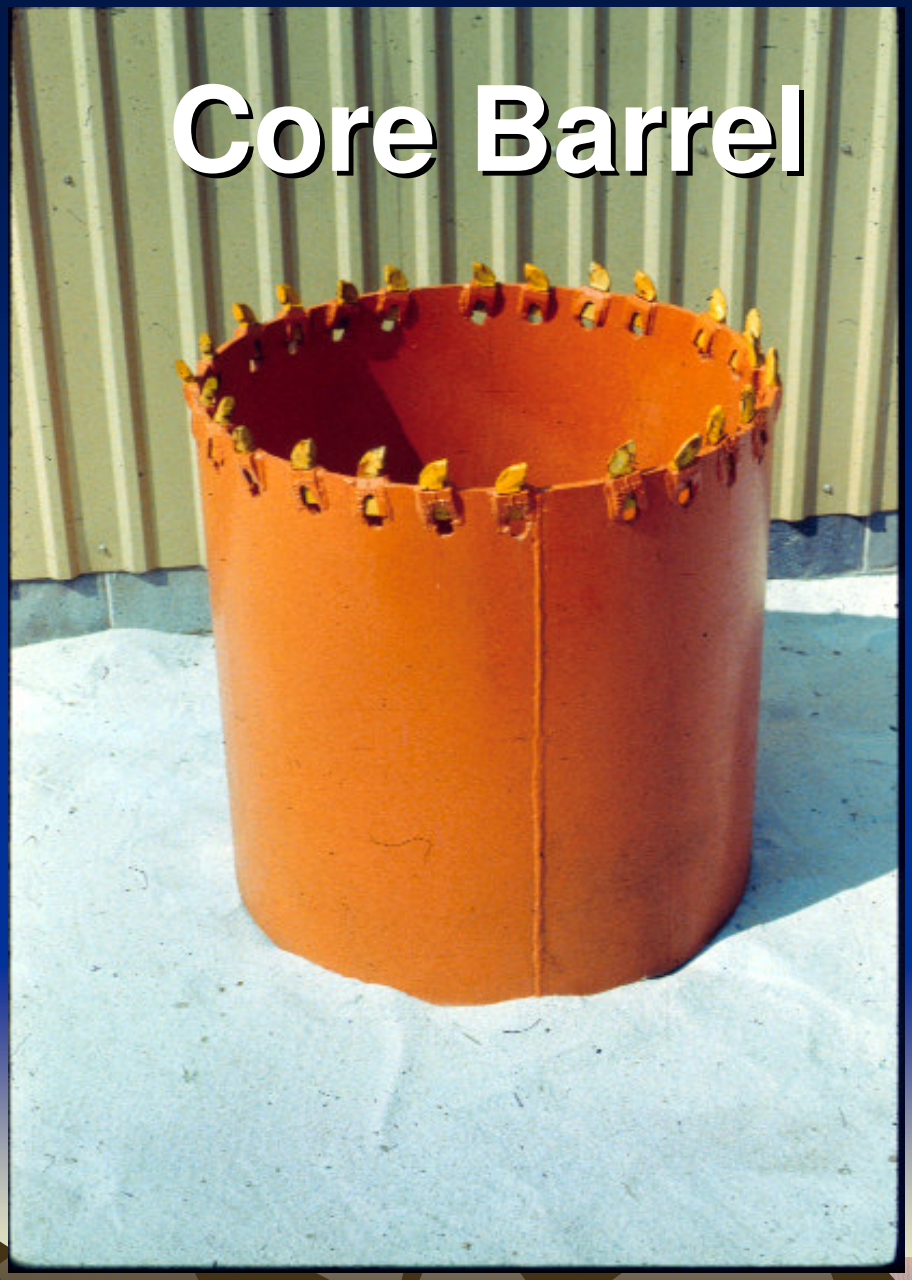
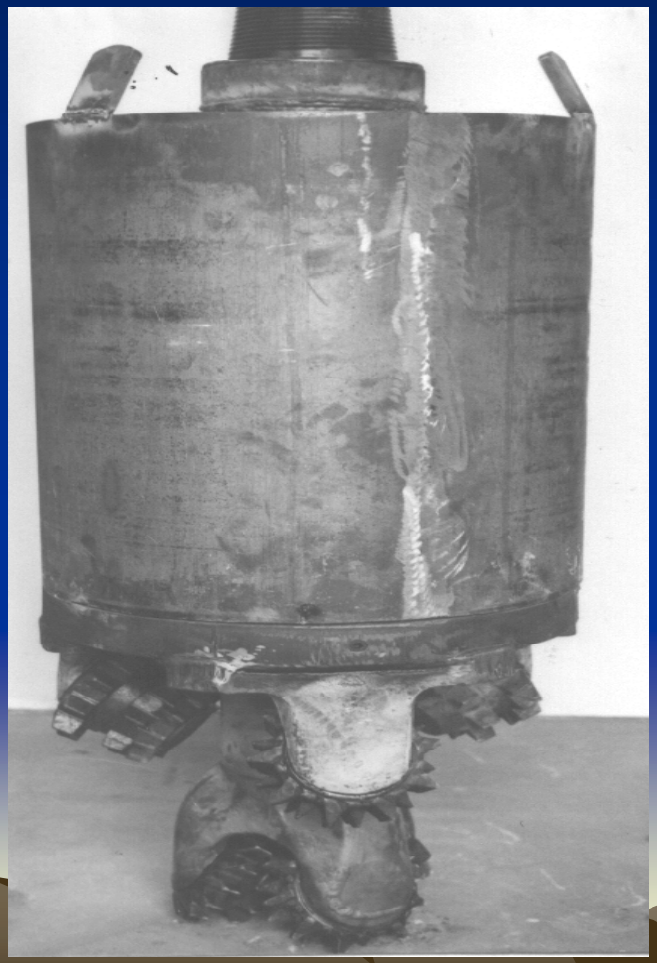
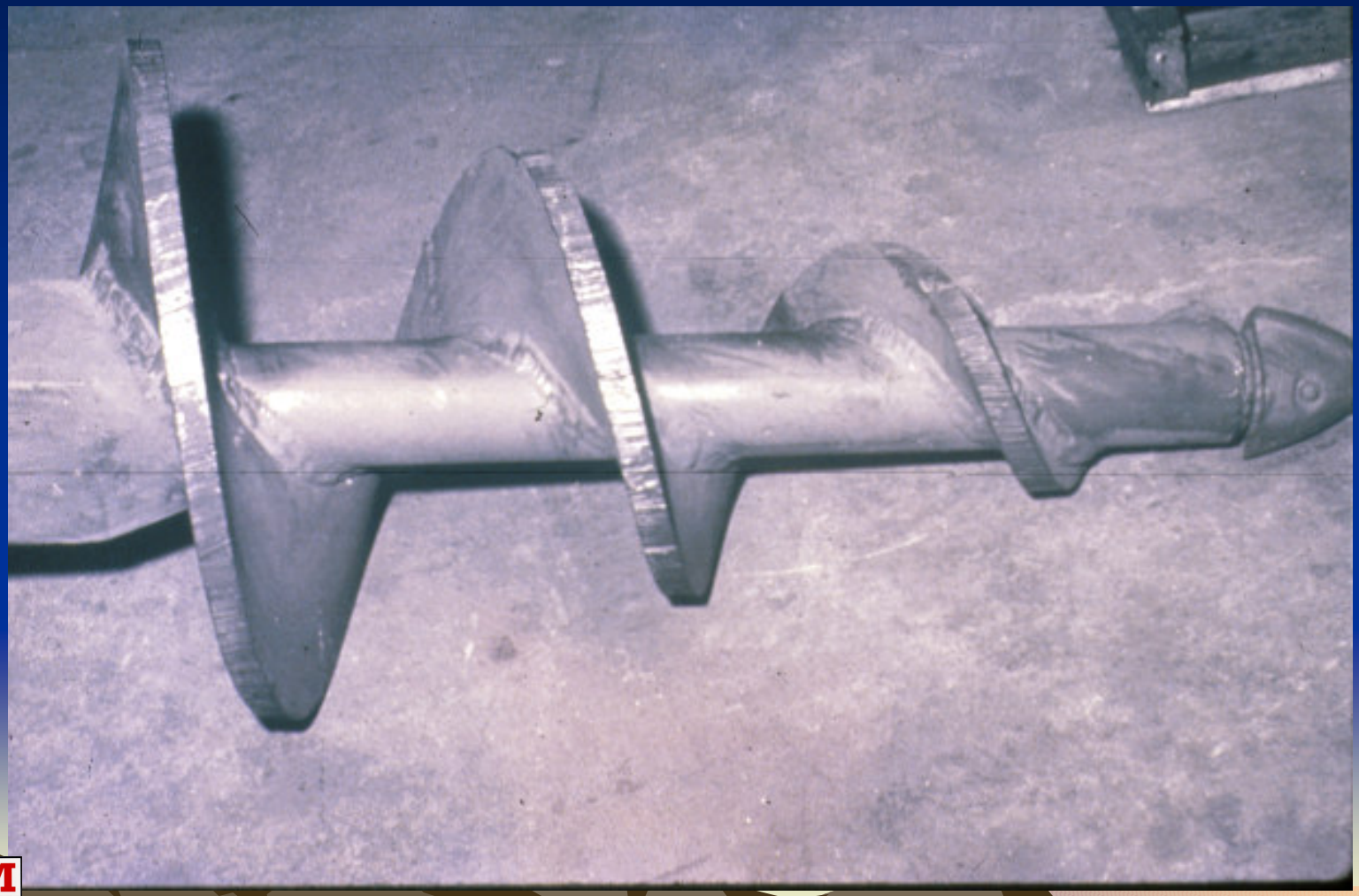
Core Barrel



Other Options in Hard Rock



Boulder
“Getter Outer”

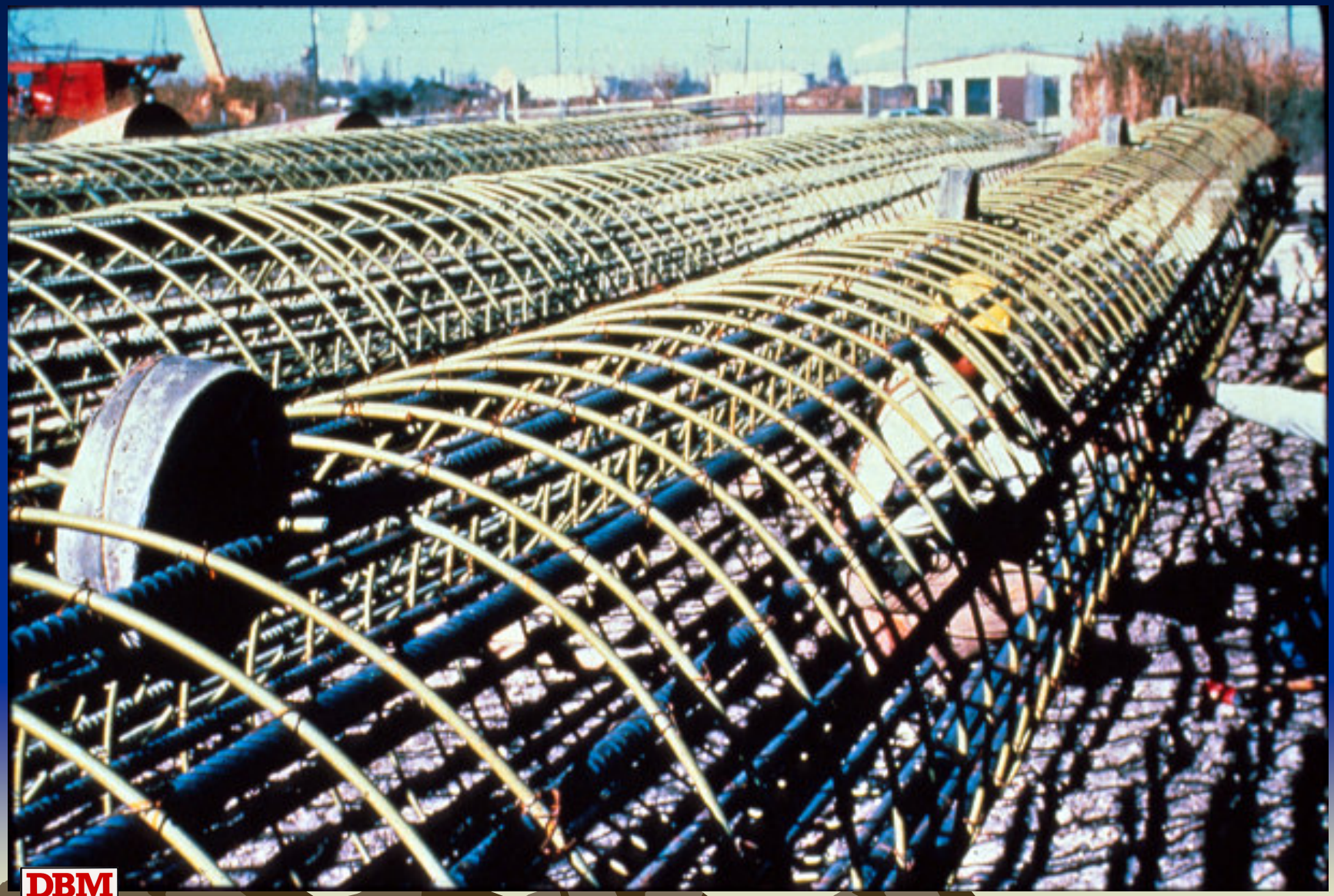


Clean-Out Bucket

Belling Tool

AirLift

STEEL & CONCRETE PLACEMENT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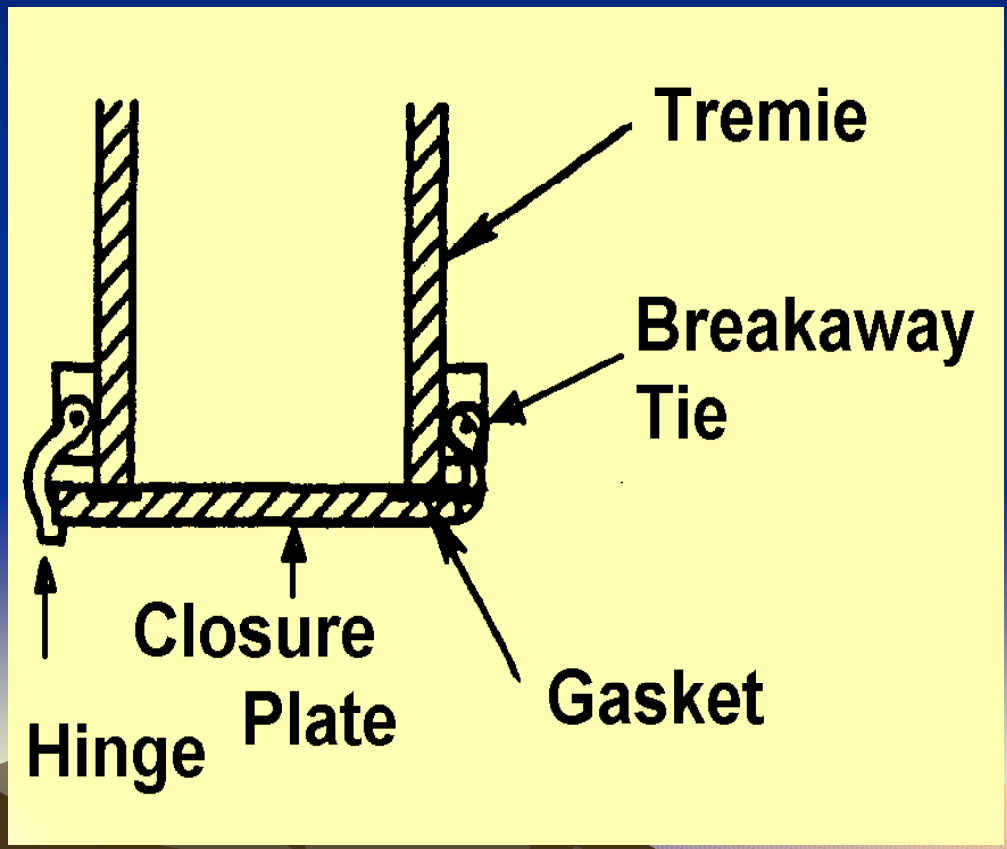
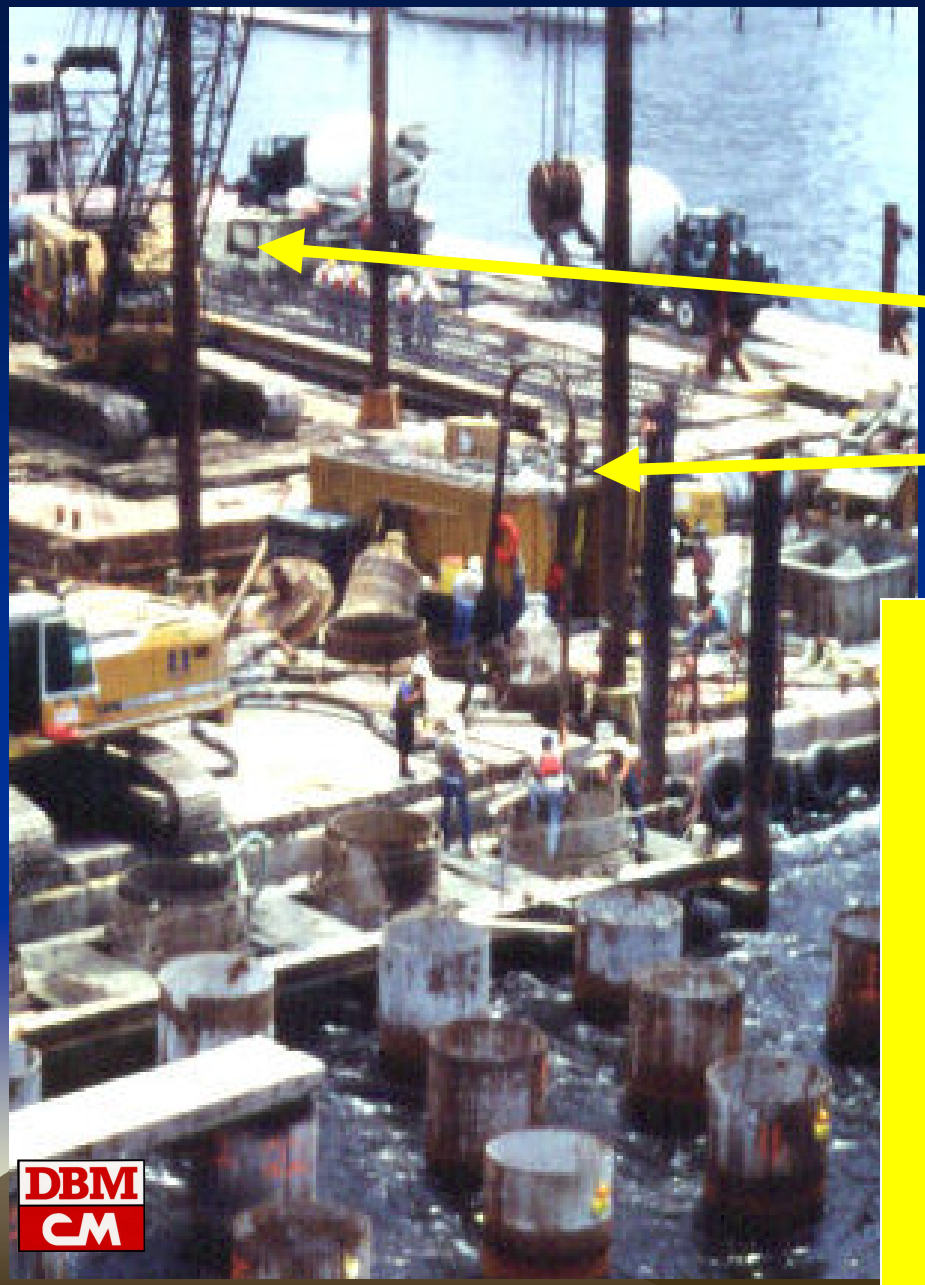
Concrete Placement by Free Fall

Gravity Tremie Placement

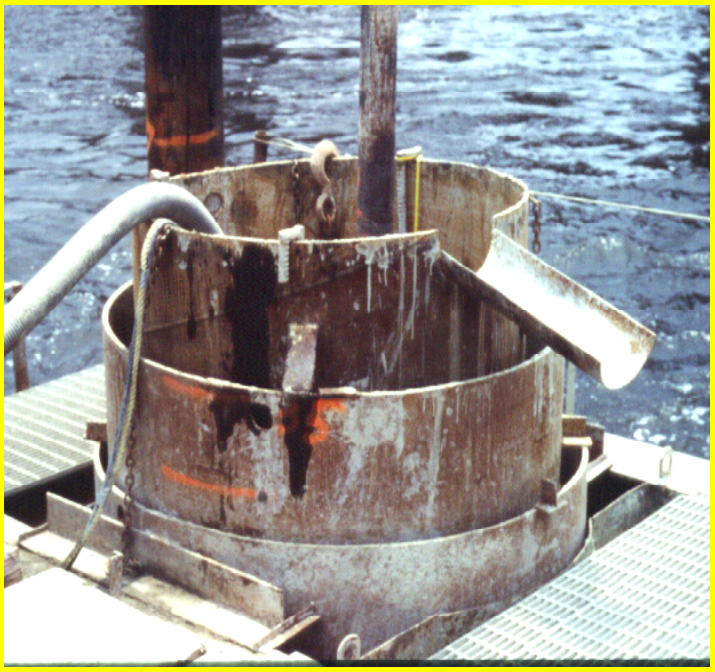


Pump Line Placement



Pump

Pump Line



THANK YOU!!!

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